Multi-Function Timer
TM10-AVGTMR-xxx

Timer Features:

- Microcontroller based timing
- Remaining/Elapsed Time Display
- Optional Password protection for unit/range and timer type
- Set time range from 0.01 sec to 999 hours
- Digital setting with 1% resolution, 1% Absolute Accuracy, and 1% Repeat Accuracy

10 Programmable Timer Types:

- T1 (Delay On Make)
- T2 (Single Shot)
- T3 (Delay On Break)
- Cycle
- Interval
- Re-triggerable Single Shot
- Inverted Single Shot
- Trailing Single Shot
- Inverted Delay On Break
- Accumulated Delay On Make

TECHNICAL DATA

TIME DELAY

Range: Depends on the Time Unit

5.EC	0.01 - 9.99 seconds
SEC	1-999 seconds
ꞁꞁı n	1-999 minutes
Hr	1-999 hours

Repeat Accuracy: +/-1% or 20 ms, whichever is greater
Reset Time: 5 ms max. (2 ms typical)

ENVIRONMENTAL
Storage Temperature: -50°C to 150°C
Operating Temperature: -20°C to 60°C

INPUT
Operating Voltage:
120, 240 VAC; 12, 24 VDC ±10% (Unfiltered input voltage to DC Models must be full-wave rectified)
Power Consumption: 3 VA max.
Frequency: 50/60 Hz

PROTECTION
Dielectric Breakdown: 2000 VAC, RMS min. at 60 Hz between input and outputs and 1000VAC between outputs
Polarity: DC units are reverse polarity protected

OUTPUT
Type: Relay contacts
Form: DPDT (Double Pole Double Throw), 2 form C
Rating: 7A max. Resistive at 250 VAC; 100 mA at 5 VDC min. load current
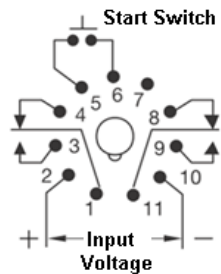**Life (Number of Operations)**:
Mechanical: 1 x 10^7
Electrical: 1 x 10^5
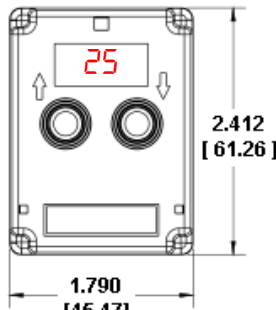
MECHANICAL DATA – WIRING AND DIMENSIONS

Termination: 11-pin plug
Mounting type: Socket Mount
Dimensions: 1.790 x 2.887 x 2.412 in.

Unit: inch [mm]

11-PIN CONFIGURATION

FRONT VIEW
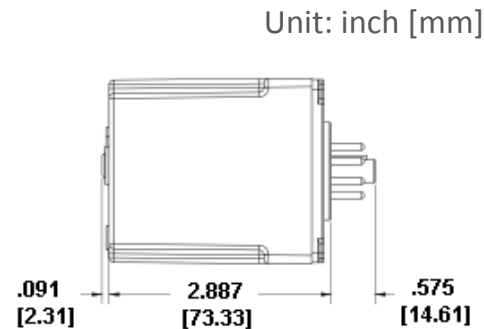
SIDE VIEW

HOW TO ORDER

Multi-Function Timers

12 VDC Input:	**TM10-AVGTMR-466**
24 VDC Input:	**TM10-AVGTMR-462**
120 VAC Input:	**TM10-AVGTMR-461**
240 VAC Input:	**TM10-AVGTMR-465**

Socket: *All models require an 11-pin socket listed below:*

11 Pin Socket:	**AVG-TMRSKT-11PIN**

The 10 different Modes available in this Timer unit are as follows:

Delay On Make Timer (t 1)

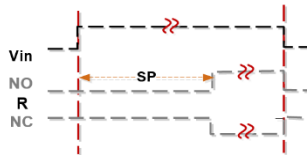When input power is applied, the timer delay (SP) begins. At the end of the set time delay, the Relay (R) energizes (contacts transfer) and remains energized as long as input power is supplied. The timer and relay are reset on loss of power.

Single Shot Timer (t2)

Input Power (V) must be applied to the timer before and during timing. Being Positive edge-triggered, the Relay (R) energizes (contacts transfer) upon momentary or maintained closure of the switch (S1). The energized Relay triggers the time delay (SP). When the timer delay finishes counting down, the Relay de-energizes.
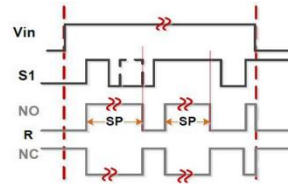
Note: The time-delay remains unaffected if the switch is opened or closed during the timing countdown. The Timer is reset and re-started the next time the Switch (S1) is closed. Losing power resets the time delay and de-energizes the output.

Delay On Break Timer (t3)

Input Power (V) must be applied to the timer before and during timing. When the switch (S1) is closed, the Relay (R) is energized (contacts transfer). The time delay (SP) begins when the switch is opened (negative edge-triggered) and the output remains energized during timing. The Relay de-energizes at the end of the time delay. Closing the switch while timing will resets the time delay while the relay remains energized.
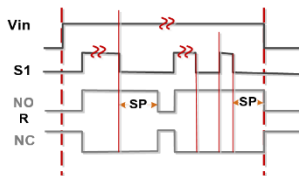
Cycle Timer (CYC)

When input power is applied, the Relay output is energized and the TON timer begins counting down from the set TON time. At the end of the TON time, the output de-energizes and the TOF time begins its countdown. At the end of the TOF time, the output is energized and the cycle repeats as long as power is applied.
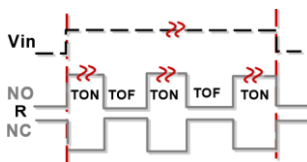
Interval Timer (int)

This mode of operation indicates that the timer delay (SP) begins (and the Relay output is energized) as soon as the input power at operating voltage (V) is supplied. At the end of time delay, the output is de-energized and remains de-energized until power is removed.
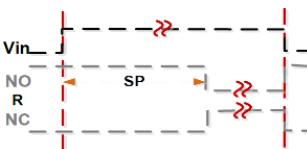
Retriggerable Single Shot Timer (rSS)

Input Power (V) must be applied to the timer before and during timing. Upon momentary or maintained closure of the initiate switch (Positive edge-triggered), the Relay output is energized for a measured interval of time (SP). When the timer finishes timing, the Relay de-energizes.
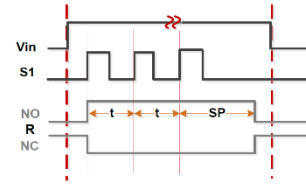
> **Note:** Unlike the Single-shot timer, the time-delay is immediately Reset if the switch is closed while timing.

Trailing Single Shot (tSS)

Input Power (V) must be applied to the timer before and during timing. Although the timer remains unaffected when the Switch is initially closed, the Relay (R) output is energized as soon as the switch is opened (Trailing edge-triggered), also triggering the time delay (SP). When the timer finishes timing, the Relay de-energizes. The timing remains unaffected if the switch is opened or closed during the timing. The Timer is reset and re-started the next time the Switch (S1) is opened.
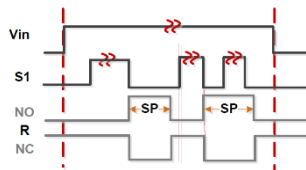
Inverted Single shot (I SS)

Input Power (V) must be applied to the timer before and during timing. On startup, the Relay output is automatically energized. The Relay (R) output is de-energized upon momentary or maintained closure of the switch (S1). The Relay remains de-energized for a measured time-delay. When the timer finishes timing, the Relay re-energizes.
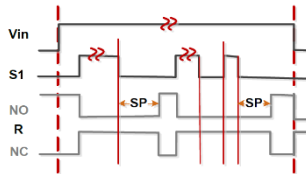
Note: The time-delay remains unaffected if the switch is opened or closed while timing. The Timer is reset and re-started the next time the Switch (S1) is closed.

Inverted Delay On Break (idb)

When the switch (S1) is closed, the Relay (R) output is de-energized. The time delay begins when the switch is opened (Negative edge triggered) and the output remains de-energized during timing. The output is energized at the end of the time delay.
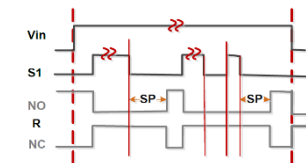
> **Note:** Closing the switch while timing resets the time delay, but the output remains de-energized.

Accumulative Delay On Make (AdL)

This type of operation indicates that the timer delay begins timing upon momentary or maintained closure of the switch (S1).The timing is paused whenever the switch is opened. If S1 is re-opened, timing continues to accumulate. When the total accumulated elapsed time equals the selected time delay (SP), the Relay(R) output is energized and it remains so as long as input power is supplied. SP = t 1 + t 2 +t 3……
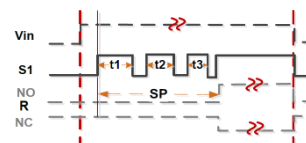
Operation and Programming (Non-Cycle)

Timer has two buttons and a 3 digit display for programming. Following button actions are used in programming:

- Pressing Left (**L**) or ↑ button increments or moves from one parameter to another
- Pressing Right (**R**) or ↓ button decrements a value or selects a parameter to edit
- Pressing Both Left and Right (**LR**) button saves the displayed value and/or advances timer to next parameter.
- Pressing Left (**L**) or Right (**R**) from the default display will prompt timer to scroll through programmed values.

View Programmed Values:

900 → **L** or **R** Button → t1 (Timer Type) → SEC (Units of Time) → SP (Setpoint) → 900 (Programmed Setpoint Limit) → u1.1 (Firmware version)

Adjust Setpoint:

900 → Both **LR** → SP (Display shows SP) → **R** Button → 900 (Programmed Setpoint Limit) → Use **L** to increment **R** to decrement to desired value → 930 (New Setpoint Value) → Both **LR** to save → Return to default display

Programming Mode:

1. (Default display) 900 → Both **LR**

Note:
If the Timer remains in an idle state for more than 6 seconds, it automatically returns to default display.

2. SP → Both **LR**

Please see *Adjust Setpoint* section above for information on changing the Setpoint limit prior to entering a password.

3. PAS
If Password is NOT set, timer will proceed to Step 4
→ 000 (Screen to input password) → **L** to increment **R** to decrement to correct password → 015 (Password value) → Both **LR** to save → Go to Step 4 (Incorrect Password *bAd* will return unit to default display)

4. tYP → **R** button → t1 (Current Type) → Use **R** Button to scroll →

Select Timer Type:
t1	Delay on Make	rSS	Retriggerable Single Shot
t2	Single Shot	tSS	Inverted Single Shot
t3	Delay on Make	iSS	Trailing Single Shot
CYC	Cycle	idb	Inverted Delay On Break
int	Interval	AdL	Accumulated Delay On Break

Press **LR** to select displayed (Go to Step 5)

L Button

5. Unt → **R** button → SEC (Current Unit) → Use **R** Button to scroll →

Select Units of Time:
S.EC	Second (10ms) Resolution
SEC	Seconds
iin	Minute
Hr	Hour

Press **LR** to select displayed (Go to Step 6)

L Button

6. SP → **R** button → 900 (Current Setpoint limit) → **L** to increment **R** to decrement to desired value → 930 (New Setpoint Value) → Both **LR** to save → Go to Step 7

L Button

7. PAS → **R** button → 000 (Screen to input password) → **L** to increment **R** to decrement to change password → 016 (New Password (Saving 000 will remove password)) → Both **LR** to save → Y n → L to save Password / R to discard Password

Multi-Function Timer
TM10-AVGTMR-xxx

For Cycle Timer Function Only

View Programmed Values:

30	→ L or R Button → CYC	SEC	tOn	30	tOF	25	u1.1
	Timer Type	Units of time	Cycle ON	Programmed Cycle ON time	Cycle OFF	Programmed Cycle OFF time	Firmware version

Adjust TON or TOF:

30	Both LR → tOn	R Button → 30	L to increment R to decrement to desired value → 35	Both LR to save → tOF	R Button → 25	L to increment R to decrement to desired value → 20	Both LR to save and return to display
Countdown display	Cycle OFF	Programmed Cycle ON time	New Cycle ON time	Cycle OFF	Programmed Cycle OFF time	New Cycle OFF time	

Programming Mode:

1 (Countdown display) — 30

Both LR

Note:
If the Timer remains in an idle state for more than 6 seconds, it automatically returns to countdown display.

2 — tOn

Both LR

Please see *Adjust TON or TOF* section above for information on changing the Cycle On or Cycle OFF time.

3 — tOF

Both LR

4 — PAS

If Password is NOT set, timer will proceed to Step 5

000 — Screen to input password → L to increment R to decrement to correct Password → 015 Password Value → Both LR to save → Go to Step 5 (Incorrect Password bAd will return unit to countdown display)

5 — tYP — R button → CYC Current Type → Use R Button to scroll →

Select Timer Type:

t1	Delay on Make	rSS	Retriggerable Single Shot
t2	Single Shot	tSS	Inverted Single Shot
t3	Delay on Make	ISS	Trailing Single Shot
CYC	Cycle	Idb	Inverted Delay On Break
Int	Interval	AdL	Accumulated Delay On Break

Press LR to select displayed (Go to Step 6)

L Button

6 — Unt — R button → SEC Current Unit → Use R Button to scroll →

Select Units of Time:

S_EC	Second (10ms) Resolution
SEC	Seconds
min	Minute
Hr	Hour

Press LR to select displayed (Go to Step 7)

L Button

7 — tOn — R button → 30 Current TON time → L to increment R to decrement to desired value → 35 New TON time → Both LR to save → Go to Step 8

L Button

8 — tOF — R button → 25 Current TOF time → L to increment R to decrement to desired value → 20 New TOF time → Both LR to save → Go to Step 9

L Button

9 — PAS — R button → 000 Screen to input password → L to increment R to decrement to change Password → 016 New Password (Saving 000 will remove password) → Both LR to save → Y n (L to save Password / R to discard Password)